

Appendix A
Detail Evaluation of ABAR-W375-99-00013
Modification of SRD Criteria 4.5, Fire Protection (ISMP References)

The purpose of this appendix is to document the detailed examination of the changes proposed by ABAR-99-00013 and the rationale for acceptance or rejection of the changes. The appendix is organized by individual change, beginning with the proposed change to SRD safety criterion 4.5-8.

Safety Criterion 4.5-8

This criterion requires that the facility shall include physical access and appropriate equipment to facilitate effective intervention by the Hanford Site fire department, such as an interior standpipe system.

The proposed change is to eliminate the reference to ISMP section 3.10, Emergency Preparedness, as an implementing standard for SRD safety criterion 4.5-8.

Implementing standard DOE G-440.1, Section III, paragraph 6.7 states, as a general requirement, that physical access and appropriate equipment is required to facilitate effective intervention by the fire department, such as an interior standpipe system(s) in multi-story or large facilities with complex configurations. The guide then provides supporting guidelines on inspection, testing, and maintenance of fire protection equipment; fire hazards analysis; fire department operations; etc.

This change is acceptable because ISMP section 3.10 merely restates the criterion [i.e., “The facility design facilitates access and intervention by the Hanford Site fire department (e.g., the ability to connect to the interior standpipe system)”]. The ISMP section is repetitive and can be deleted as an ad hoc implementing standard.

While this ABAR would eliminate reference in the SRD to ISMP section 3.10 as an ad hoc implementing standard for safety criterion 4.5-8, ISMP section 3.10 and SRD safety criterion 4.5-8 remain part of the authorization basis, unchanged by this ABAR.

Safety Criterion 4.5-15

This criterion requires that the fire protection program include the following:

- (1) Organization, training, and responsibilities of the fire protection staff, including a trained and equipped fire brigade.
- (2) Inspection, testing, and maintenance of all fire protection systems by personnel properly qualified by experience and training in fire protection systems.
- (3) Surveillance to ensure that fire barriers are in place and that fire suppression systems and components are operable.

- (4) Training of all employees in basic fire safety.
- (5) Periodic performance of fire drills.

The proposed change is to eliminate the reference to ISMP sections 1.3.9, Quality Assurance Program; 3.10, Emergency Preparedness; 3.15, Training and Qualification; and, 11.0, Organization Roles, Responsibilities and Authorities; as implementing standards for SRD safety criterion 4.5-15.

- ISMP section 1.3.9 provides general, top-level requirements for the project Quality Assurance Program. The ISMP section provides no relevant implementing standard for the five (5) fire protection program safety sub-criteria listed above.
- ISMP section 3.10 restates SRD fire protection safety criterion 4.5-8, as noted above.
- ISMP section 3.15 provides general, top-level requirements for training of facility personnel. The ISMP section provides no relevant implementing standard for the five (5) fire protection program safety sub-criteria listed above. The safety criterion addresses required elements, including training, of the RPP-WTP fire protection program and does not address the overall facility training plan.
- ISMP section 11.0 provides general, top-level organizational roles, responsibilities and authorities for the project organization during the design/construction and operational phases of the project. Fire protection organizational roles, responsibilities and authorities are limited to a statement that one of the Licensing, Permitting, and Safety Manager's responsibilities is implementing the fire protection program. The section also notes that project Architectural Engineering is responsible for designing fire prevention, detection, and suppression features in compliance with state and federal requirements. Neither of these general statements of responsibility provides an implementing standard that is relevant for the safety criterion 4.5-15 element (sub-criterion 1) dealing with the fire protection program organization and responsibilities.

Implementing standard DOE G-440.1, section III.4.2 requires that the basic elements of an acceptable fire protection program include comprehensive, written fire protection criteria that reflect additional site-specific aspects of the fire protection program, including: the organization, training and responsibilities of the fire protection staff; administrative aspects of the fire protection program; and requirements for the design, installation, operability, inspection, maintenance and testing of fire protection systems.

Implementing standard NFPA 801, section 2-4 specifies the requirements for the facility fire prevention program, including that a written fire prevention program shall be established and include, among other things, fire safety information for all employees and contractors, including familiarization with fire prevention procedures, emergency alarms and procedures, and procedures for reporting a fire.

NFPA 801, section 2-5 specifies the testing, inspection, and maintenance requirements for fire protection systems installed in the facility by invoking the applicable requirements from other NFPA standards (called-out in chapter 4 of NFPA 801).

NFPA 801, section 2-7 specifies requirements for the facility fire emergency plan, including the conduct of drills and exercises to verify the adequacy of the fire emergency plan, including practice sessions coordinated around previously developed valid emergency scenarios particular to the facility, and fire prevention surveillance.

NFPA 801, section 2-8 specifies requirements for the facility fire emergency organization, including the following:

- The size of the facility and its staff, the complexity of fire-fighting problems, and the availability and response time of a public fire department shall determine the composition of the fire emergency organization.
- Fire emergency organizations shall conduct drills at least quarterly, and they shall be critiqued by competent individuals. The drill critique shall be documented, and recommendations for improvements shall be implemented. Practice sessions shall be coordinated around previously developed valid emergency scenarios particular to the facility.

This change is acceptable because:

- As noted above, the referenced sections of the ISMP do not provide an implementing standard that is relevant for the fire protection sub-criteria of SRD safety criterion 4.5-15.
- Implementing standards DOE G-440.1 and NFPA 801-95, as described above, adequately implement SRD safety criterion 4.5-15.

While this ABAR would eliminate reference in the SRD to ISMP sections 1.3.9, 3.10, 3.15, and 11.0 as ad hoc implementing standards for safety criterion 4.5-15, ISMP sections 1.3.9, 3.10, 3.15, and 11.0 and SRD safety criterion 4.5-15 remain part of the authorization basis, unchanged by this ABAR.

Safety Criterion 4.5-16

This criterion requires that the fire protection program will include a plan to identify, prioritize and monitor the status of fire protection-related appraisal findings/recommendations until final resolution is achieved. When final resolution will be significantly delayed, appropriate interim compensatory measures shall be implemented to minimize the fire risk.

The proposed change is to eliminate the reference to ISMP section 10.0, Assessments, as an implementing standard for SRD safety criterion 4.5-16.

Implementing standard DOE G-440.1, section III.4.10 requires that the basic elements of an acceptable fire protection program include a program to identify, prioritize and monitor the status

of fire protection-related appraisal findings/recommendations until final resolution is achieved. When final resolution will be significantly delayed, appropriate interim compensatory measures should be implemented to minimize the fire risk. Section IV.7.6 of the guide requires that fire safety assessment reports should include a description of what was done during the effort (areas toured, documents reviewed, people interviewed). It should feature a “baseline” description of the facility, hazards and other occupancy considerations, and fire protection features. In addition, the report should document changes of significance that have occurred within the facility since the last assessment that affect fire safety, and it should list all noted deficiencies, along with a recommendation for remediation and interim compensatory measures, if necessary, pending resolution.

This change is acceptable because ISMP section 10.0 merely states that, during the design, construction, operation, and deactivation phases of the project, assessments are directed at, among other things, fire protection. The ISMP section provides no implementing standard that is relevant for the facility fire protection program self-assessment requirement of the SRD safety criterion. Implementing standard G-440.1 adequately implements SRD safety criterion 4.5-16, as described above.

While this ABAR would eliminate reference in the SRD to ISMP section 10.0 as an ad hoc implementing standard for safety criterion 4.5-16, ISMP section 10.0 and SRD safety criterion 4.5-16 remain part of the authorization basis, unchanged by this ABAR.

Safety Criterion 4.5-17

This criterion requires that the fire protection program shall ensure that fire protection requirements are documented and incorporated in the plans and specifications for all new facilities and for significant modifications of existing facilities. This includes a documented review by a qualified fire protection engineer of plans, specifications, procedures, and acceptance tests.

The proposed change is to eliminate the reference to ISMP sections 1.3.16, Configuration Management and 8.0, Document Control and Maintenance, as implementing standards for SRD safety criterion 4.5-17.

Implementing standard DOE G-440.1, section III.4.4 requires that the basic elements of an acceptable fire protection program include a system to ensure that the requirements of the DOE fire protection program are documented and incorporated in the plans and specifications for all new facilities and for significant modifications of existing facilities. This includes a documented review by a qualified fire protection engineer of plans, specifications, procedures, and acceptance tests. In addition, section IV.2.0 of the DOE guide specifies fire safety program documentation requirements that support the requirements of section III.4.4.

This change is acceptable due to the following:

- (1) ISMP section 1.3.16 only addresses general, top-level project configuration management requirements applicable during the design, construction, operation, and deactivation of RPP-WTP. The ISMP section does not provide an implementing standard that is relevant

for the safety criterion concerning attributes of the facility fire protection program.

- (2) ISMP section 8.0 only addresses general, top-level document control and maintenance requirements for the RPP-WTP project. The ISMP section notes that the project Fire Hazard Analysis; hot work permits; fire watch records; records pertaining to inspection, maintenance, and testing of fire protection equipment; records pertaining to fire protection training; and pre-fire emergency plans are project records. The ISMP section does not provide an implementing standard that is relevant for the safety criterion concerning attributes of the facility fire protection program.
- (3) Implementing standard DOE G-440.1, adequately implements SRD safety criterion 4.5-17, as described above.

While this ABAR would eliminate reference in the SRD to ISMP sections 1.3.16 and 8.0 as ad hoc implementing standards for safety criterion 4.5-17, ISMP sections 1.3.16 and 8.0 and SRD safety criterion 4.5-17 remain part of the authorization basis, unchanged by this ABAR.

Safety Criterion 4.5-18

This criterion requires that the fire protection program include a comprehensive, documented fire protection self-assessment program, which includes all aspects (program and facility) of the fire protection program.

The proposed change is to eliminate the reference to ISMP section 10.0, Assessments, as an implementing standard for SRD safety criterion 4.5-18.

Implementing standard DOE G-440.1, section III.4.9 requires that the basic elements of an acceptable fire protection program include a comprehensive, documented fire protection self-assessment program, which includes all aspects (program and facility) of the fire protection program. Assessments should be performed on a regular basis at a frequency established by DOE. Further, DOE G-440.1, section 7.0 provides detailed program- and facility-related requirements that must be implemented by the RPP-WTP fire protection self-assessment program.

This change is acceptable because ISMP section 10.0 merely states that, during the design, construction, operation, and deactivation phases of the project, assessments are directed at, among other things, fire protection. The ISMP section provides no implementing standard that is relevant for the facility fire protection program self-assessment requirement of the SRD safety criterion. Implementing standard G-440.1 adequately implements SRD safety criterion 4.5-18, as described above.

While this ABAR would eliminate reference in the SRD to ISMP section 10.0 as an ad hoc implementing standard for safety criterion 4.5-18, ISMP section 10.0 and SRD safety criterion 4.5-18 remain part of the authorization basis, unchanged by this ABAR.

Safety Criterion 4.5-20

This criterion requires performance of a facility Fire Hazards Analysis (FHA). Such a systematic analysis shall divide the facility into “fire areas” and evaluate the fire safety of each area and of the facility as a whole. For each fire area, the analysis shall:

- (1) Account for all radioactive, hazardous, and combustible materials, including estimates of their heat content.
- (2) Describe the processes performed and their potential for fire or explosion.
- (3) Account for the sources of heat and flame.
- (4) List the fire detection and suppression equipment.
- (5) Consider credible fire scenarios and evaluate the adequacy of the fire protection measures.

In addition, the FHA shall consider other buildings or installations close to process buildings that contain flammable, combustible, or reactive liquid or gas storage.

The FHA shall confirm that the facility can be placed in a safe state during and after all credible fire and explosion conditions.

The proposed change is to eliminate the reference to ISMP section 4.2.3.1, Safety Analysis Reports, as an implementing standard for SRD safety criterion 4.5-20.

Implementing standard DOE G-440.1, section IV.4.0, “Fire Hazards Analyses,” specifies extensive requirements for the facility FHA, including the purpose for an FHA, fire protection safe shutdown analysis, fire safety issues to be addressed, fire protection system failure assumptions, fire area definition and analysis, consideration of safety class systems, effects of the facility air distribution system, use of fire models, combustible loadings and transient combustibles, high-bay considerations, and FHA documentation.

Implementing standard NFPA 801, section 2-3 also provides requirements for the facility FHA. This includes the requirement for a documented FHA initiated early in the design process or when configuration changes are made to ensure that the fire prevention and fire protection requirements of the standard have been evaluated. The evaluation shall consider the facility’s specific design, layout, and anticipated operating needs. The evaluation shall also consider acceptable means for separation or control of hazards, the control or elimination of ignition sources, and the suppression of fires.

This change is acceptable due to the following:

- ISMP section 4.2.3.1 merely provides general, top-level requirements for the format and content of project Safety Analysis Reports (SAR) and identifies deviations from the SAR content guidance of NRC Regulatory Guide 3.52, "Standard Format and Content for the Health and Safety Sections of License Applications for Fuel Cycle Facilities." The ISMP

section provides no implementing standard that is relevant for the FHA requirements of SRD safety criterion 4.5-20.

- Implementing standards DOE G-440.1 and NFPA 801-95, as described above, adequately implement SRD safety criterion 4.5-20.

While this ABAR would eliminate reference in the SRD to ISMP section 4.2.3.1 as an ad hoc implementing standard for safety criterion 4.5-20, ISMP section 4.2.3.1 and SRD safety criterion 4.5-20 remain part of the authorization basis, unchanged by this ABAR.

Safety Criterion 4.5-21

This criterion requires that the fire protection program shall be under the direction of an individual who has been delegated authority commensurate with the responsibilities of the position and who has available staff knowledgeable in both fire protection and nuclear safety.

The proposed change is to eliminate the reference to ISMP section 4.2.3.1, Safety Analysis Reports, as an implementing standard for SRD safety criterion 4.5-21.

Implementing standard DOE G-440.1, section IV.4.0 provides a partial implementation basis for this SRD safety criterion by requiring that a sufficient number of qualified fire safety professionals (fire protection engineers, fire department personnel and technicians) should be on staff to develop, implement and maintain the fire protection program.

This change is acceptable due to the following:

- ISMP section 4.2.3.1 merely provides general, top-level requirements for the format and content of project SAR and identifies deviations from the SAR content guidance of NRC Regulatory Guide 3.52. The ISMP section provides no implementing standard that is relevant for the fire protection program management and staffing requirements of SRD safety criterion 4.5-21.
- Implementing standard DOE G-440.1, as described above, adequately implements SRD safety criterion 4.5-21.

While this ABAR would eliminate reference in the SRD to ISMP section 4.2.3.1 as an ad hoc implementing standard for safety criterion 4.5-21, ISMP section 4.2.3.1 and SRD safety criterion 4.5-21 remain part of the authorization basis, unchanged by this ABAR.

Safety Criterion 4.5-22

This criterion requires that the facility should have on file, and ready to use, a Pre-Fire Plan. The Pre-Fire Plan should assign individual and alternate responsibilities for responding to a fire alarm or call, assessing the situation, suppressing incipient fires, assembling the site Fire Brigade, and if necessary, requesting Hanford Site fire department assistance, personnel evacuation, orderly shutdown of processes, and safeguarding (if necessary) and control of radioactive and hazardous material.

The plan should clearly indicate, preferably with the help of site plans and drawings, the locations of the fire department-compatible connections and fire-fighting equipment, such as portable extinguishers, automatic fire suppression systems, sectional valves, standpipes, hydrants, and hoses. It should also indicate the areas of concentrations of combustibles, storages of flammable and combustible liquids, and areas where use of water for fire suppression is restricted because of nuclear criticality or other concerns.

The Pre-Fire Plan should be prepared in consultation and coordination with the Hanford Site fire department. The Hanford Site fire department personnel should be given familiarization tours of the facility at least once a year.

The proposed change is to eliminate the reference to ISMP section 4.2.3.1, Safety Analysis Reports, as an implementing standard for SRD safety criterion 4.5-22.

Implementing standard G-440.1, section III.4.8 requires that the basic elements of an acceptable fire protection program include written pre-fire strategies, plans, and standard operating procedures to enhance the effectiveness of site fire-fighting forces, where provided. Such procedures include those governing the use of fire-fighting water or other neutron-moderating materials to suppress fire within or adjacent to moderation controlled areas. The standard states that restrictions on the use of water should be fully justified on the basis of criticality safety. The DOE guide states further, in section IV.6.9, that training of emergency responders should be based on existing requirements such as those delineated in 29 CFR Parts 1910 and 1926, as well as criteria developed by the NFPA. In addition, emergency responders should be provided with sufficient site-specific training and familiarization to enable them to deal effectively with the unique conditions which characterize DOE facilities. As part of this effort, regular facility tours should be conducted utilizing current pre-plans.

Implementing standard NFPA 801, section 2-7 specifies requirements for fire emergency plans, including response to fire alarms and fire systems' supervisory alarms; notification of personnel involved in the plan; evacuation from the fire area of personnel not directly involved in fire-fighting activities; coordination with security forces, radiation protection personnel, and other designated personnel for the admission of the public fire department and other emergency response agencies; fire extinguishment activities, particularly those that are unique to facilities handling radioactive materials; requirements for periodic drills and exercises to verify the adequacy of the fire emergency plan, including practice sessions coordinated around previously developed valid emergency scenarios particular to the facility; and, fire prevention surveillance.

This change is acceptable due to the following:

- ISMP section 4.2.3.1 merely provides general, top-level requirements for the format and content of project Safety Analysis Reports (SARs) and identifies deviations from the SAR content guidance of NRC Regulatory Guide 3.52. The ISMP section provides no implementing standard that is relevant for the pre-fire plan requirements of SRD safety criterion 4.5-21.
- Implementing standards DOE G-440.1 and NFPA 801-95, as described above, adequately implement SRD safety criterion 4.5-22.

While this ABAR would eliminate reference in the SRD to ISMP section 4.2.3.1 as an ad hoc implementing standard for safety criterion 4.5-22, ISMP section 4.2.3.1 and SRD safety criterion 4.5-22 remain part of the authorization basis, unchanged by this ABAR.

Safety Criterion 4.5-23

This criterion requires that hot work permits shall be issued for hot work operations conducted in or near the facility. The permit shall document that applicable fire prevention and protection requirements have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed. The permit shall be kept on file until completion of the hot work operations.

The proposed change is to eliminate the reference to ISMP section 5.6.6, Hot Work Operations, as an implementing standard for SRD safety criterion 4.5-23.

Implementing standard G-440.1, section III.4.3 requires that the basic elements of an acceptable fire protection program include written fire safety procedures governing the use and storage of combustible, flammable, radioactive, and hazardous materials so as to minimize the risk from fire. Such procedures should also exist for fire protection system impairments and for activities such as smoking, hot work, safety operation of process equipment, and other fire prevention measures which contribute to the decrease in fire risk.

Implementing standard NFPA 801, section 2-4 requires that a written fire prevention program be established and include, among other things, control of ignition sources, including, but not limited to, grinding, welding, and cutting.

This change is acceptable due to the following:

- ISMP section 5.6.6 merely addresses general, top-level requirements for facility hot work operations. The ISMP section provides no implementing standard that is relevant for the hot work permit requirements of SRD safety criterion 4.5-21.
- Implementing standards DOE G-440.1 and NFPA 801-95, as described above, adequately implement SRD safety criterion 4.5-23.

While this ABAR would eliminate reference in the SRD to ISMP section 5.6.6 as an ad hoc implementing standard for safety criterion 4.5-23, ISMP section 5.6.6 and SRD safety criterion 4.5-23 remain part of the authorization basis, unchanged by this ABAR.